

Building ReCommissioning

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“An expert is a damn fool a long way from home.”

- Carl Sandburg

“If it ain’t broke, don’t fix it!”

- Bert Lantz

“If it is broke, fix it!”

- Dale Herron



**US Army Corps
of Engineers**

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Definitions:

Commissioning (Cx)

Ensure that the energy systems in a new facility perform according to the original design intent.

Recommissioning (ReCx)

“Tune-up” the energy systems in an existing facility so they perform as optimally as possible



Some Observations

- **Most newly constructed buildings (in DoD and private sector) are not properly commissioned. As a result, energy systems in new facilities rarely work as intended and usually provide uncomfortable conditions for building occupants while wasting tremendous amounts of energy.**
- **DoD facilities have an ever increasing list of deferred maintenance.**
- **DoD O&M staffs have no choice but to “simplify” the operation of building energy systems further exacerbating the problem.**



Problem:

Most DoD buildings are broken!

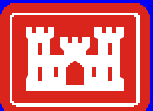
Typical Fix:

**Install more
new technology**

Result:



We lose!



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Suggested Order for Energy Improvements in a Building

- **Optimize building energy demands (loads)**
 - Educate occupants
 - Turn off unnecessary equipment
 - Adjust thermostats and lighting controls
- **ReCommission (fix) existing Energy Systems**
 - Building Systems (Lights, HVAC)
 - Heating Supply (Boilers, Heat Dist Sys)
 - Cooling Supply (Chillers, Cool Dist Sys))
- **Renovate/Retrofit Energy Systems (Energy Projects)**
 - Building Systems (Envelope, Lights, HVAC)
 - Heating Systems (Boilers, Heat Dist Sys)
 - Cooling Systems (Chillers, Cool Dist Sys)



Why ReCx? HPAC Top Ten List

Top 10 deficiencies discovered by Cxing new and ReCxing existing buildings as reported in Heating Piping and Air Conditioning, April 1998 article titled “Building Commissioning: Benefits and Costs”:

- 1. Incorrect scheduling of HVAC and lighting**
- 2. Incorrect cooling/heating sequences of operation**
- 3. Incorrect calibration of sensors/instrumentation**
- 4. Lack of control strategies for optimum comfort and efficient operation**



HPAC Top Ten List (cont)

5. **Malfunctioning air and water-side economizers**
6. **Under-utilized computer-based controls**
7. **Short cycling of HVAC equipment**
8. **Lack of design intent and documentation**
9. **Lack of training for building operators or service contractors on complex systems**
10. **Missing specified and paid-for equipment**



ReCommissioning Facts

- ReCx payback better than capital-intensive energy efficiency projects (2 yrs or less for most ReCx)
- unless ReCx also done.
- Buildings with most potential for quick ReCx payback
 - buildings with deferred maintenance
 - energy intensive buildings (annual total energy costs greater than \$2.00/sf)
- Energy System ReCx costs \$.05/sf to \$.40/sf
- Energy Savings from Energy Sys ReCx are 5-20 percent



Energy Systems ReCx Process

- Detailed Condition Assessment
- “Tune-up”/Fixes
- Functional Performance Test
- Train O&M Staff
- Long-term monitoring/maintenance



Key to ReCx Success: People

- ReCx requires good people not new technology
- ReCx personnel need specific skills
 - Technical expertise about energy systems
 - Interpersonal Communication Skills
- ReCx can be effectively done by contractors IF they are managed by a government person who has the above skills and who truly cares about ReCx being done right!

